ILLOWA PEER EXCHANGE

August 3, 2010

Davenport Maintenance Garage

Iowa Department of Transportation

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Iowa DOT Overview

- 24,867 lane miles of roadway
- 3,975 lane miles (includes ramps) of Interstate highway
- 6 Districts
- 901 Snowplows
- 1,204 operators, supervisors and mechanics
- 109 maintenance facilities
- 205,000 tons of covered salt storage (some shared facilities with cities and/or counties)
- $38 million snow/ice budget

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Current Fleet

- 901 trucks (60% tandem-axle; 40% single-axle)
- International 7000 series (60,000# GVW and 35,000# GVW)
- Target Life- 15 years (purchase 60 each year)
- Actual Life- nearing 20 years (based on purchase of 45-50 per year for the last 2-3 years)

Truck costs (equipped with front plow, underbody plow, wing, and spreader):

Medium Duty Truck	Heavy Duty Truck
2008- $95,000	2008- $113,000
2011- $125,000	2011- $150,000

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Resource Use

2009-2010

Dry Materials	Amount	5-year Average
Salt	244,829 tons	219,974 tons
Sand	41,105 tons	26,094 tons
Calcium Chloride Flake	4,094 bags (50#)	1,738 bags (50#)
TOTAL =	***286,036 tons***	***246,111 tons***

Liquid Materials	Amount	5-year Average
Salt Brine:	17,990,565 gallons	12,777,515 gallons
Calcium Chloride Brine:	81,906 gallons	89,955 gallons
TOTAL =	***18,072,471 gallons***	***12,867,470 gallons***

Staff-Hours	Amount	5-year Average
Plowing/Treating on-road	420,480 hours	256,097 hours
Total Snow/Ice Hours =	***522,492 hours***	***371,976 hours***

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Motivation for Equipment Innovations

- Make it easier to carry more brine
- Try to make our operations safer and more efficient
- Leave less snow behind the plow
  - The more you can mechanically remove, the less you'll have to chemically remove

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Plows, Wings, & Underbodies

- Jim Dowd, Winter Operations Research Analyst, Iowa DOT
- Ben Hucker, Engineering Co-op Student, Iowa DOT
- Illinois DOT District 2 (Dixon), District 3 (Ottawa), and District 4 (Peoria)
- Brien Keltner, Anamosa Highway Maintenance Supervisor, Iowa DOT

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Down-Pressure Front Plow

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Tilting Moldboard

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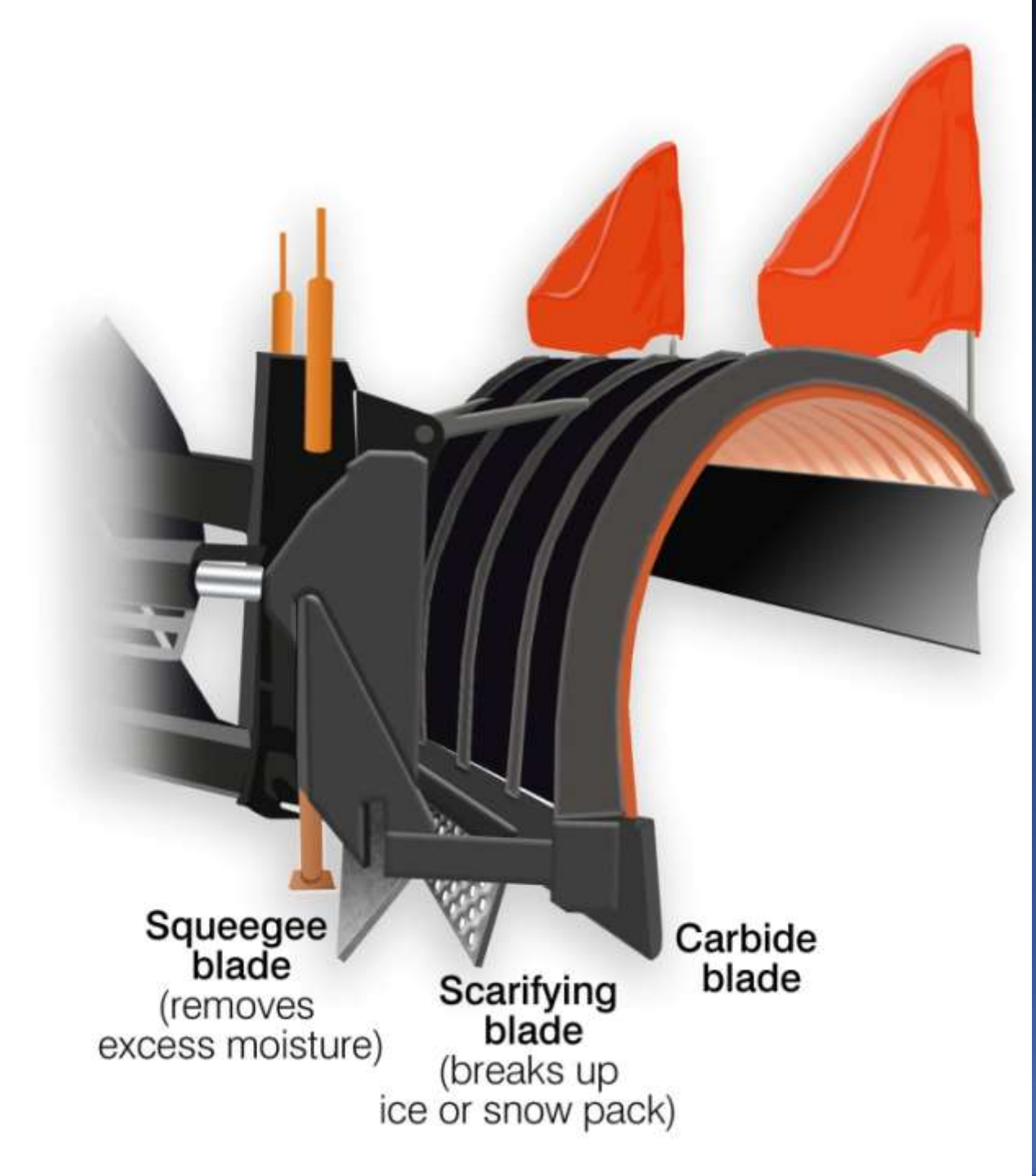

Multiple blade plow

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Prototype Plows

Henderson

Henke

Monroe Truck

Flink

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Slush Blades

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Version 1 Slush blade

Tilted back- rubber blade

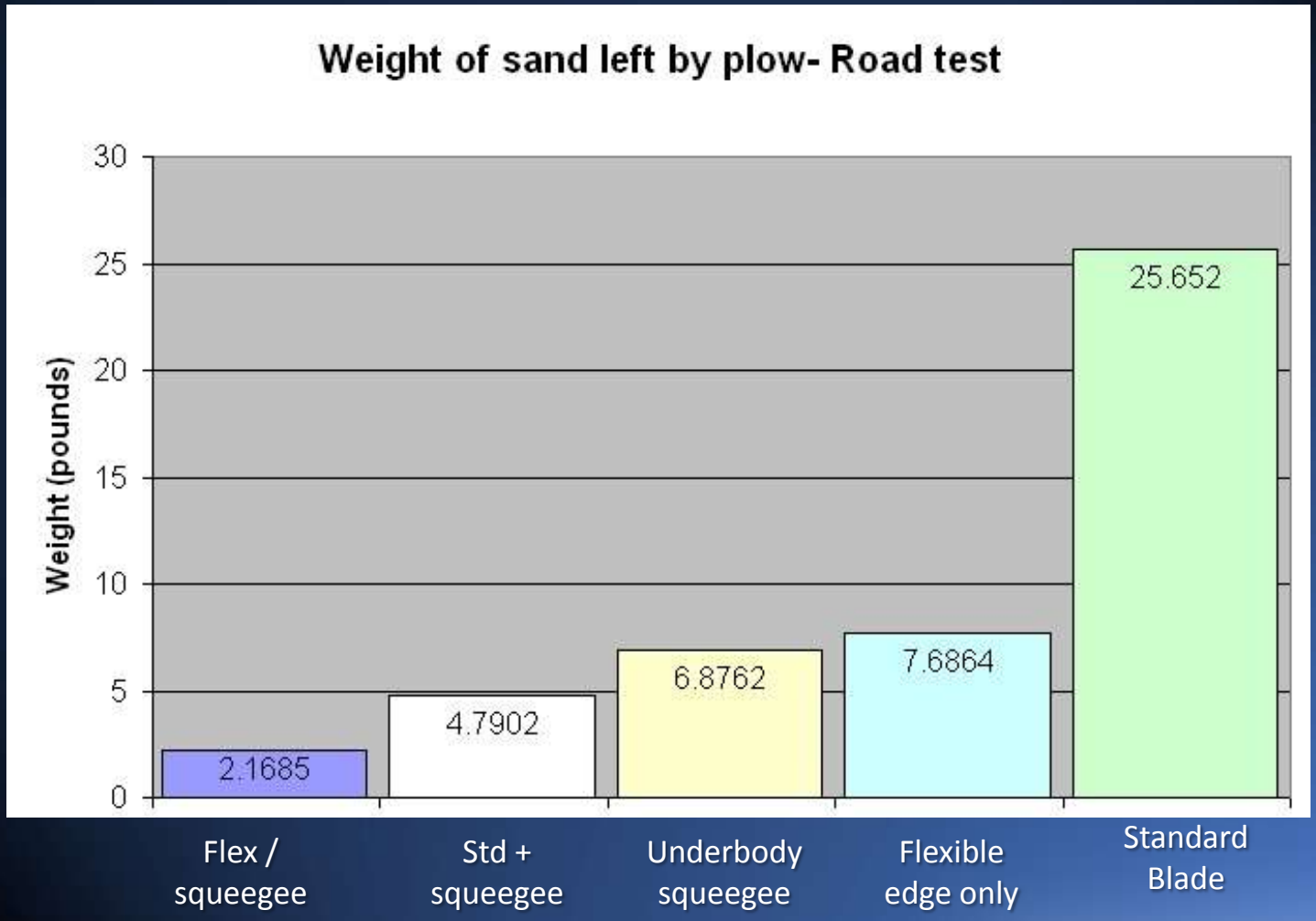
Tilted forward- cutting edge

Version 2 Slush Blade

Sand Testing

Same process repeated on highway test section

Sand Removal Comparison



Started with 106.4 LBS of sand in frame

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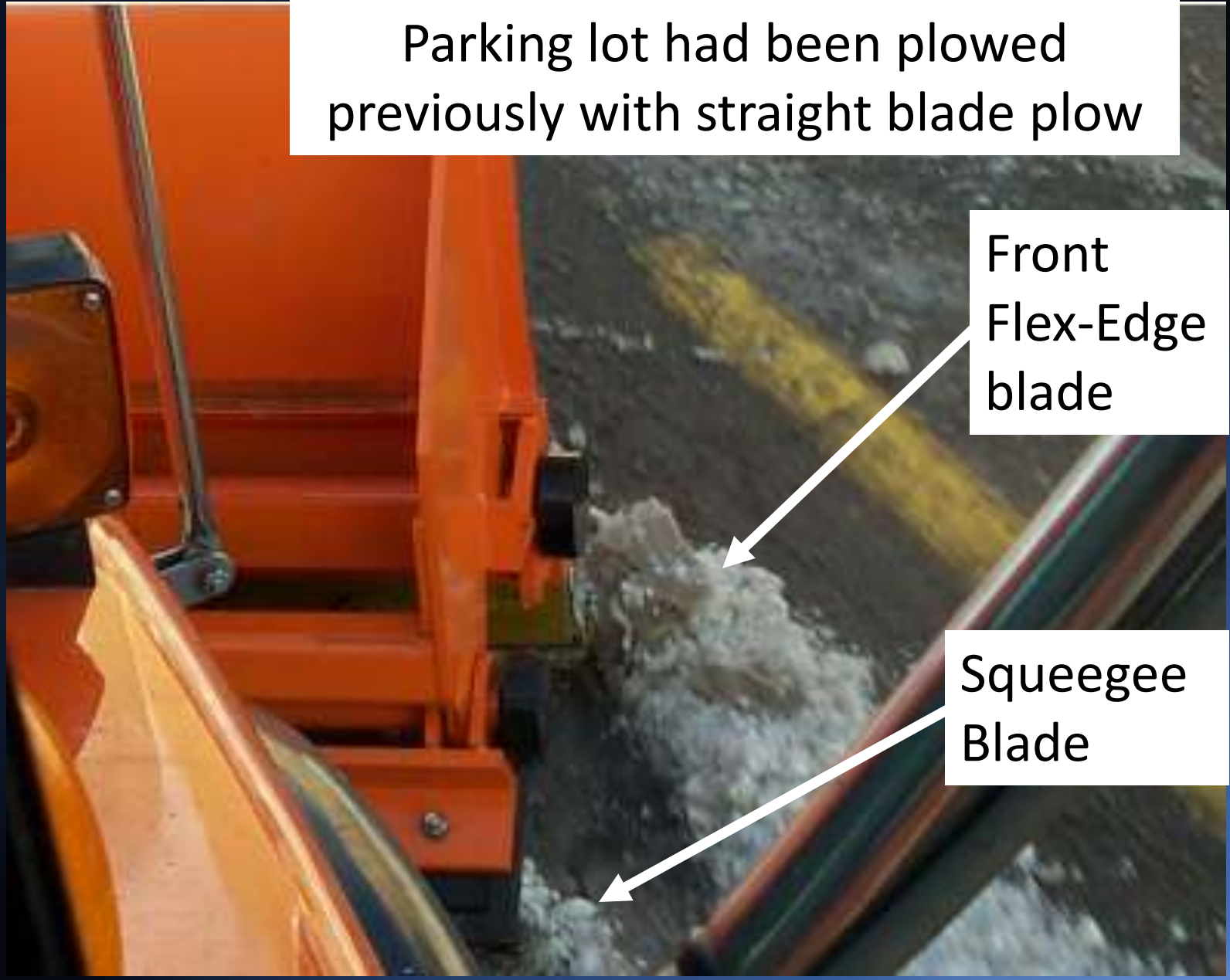

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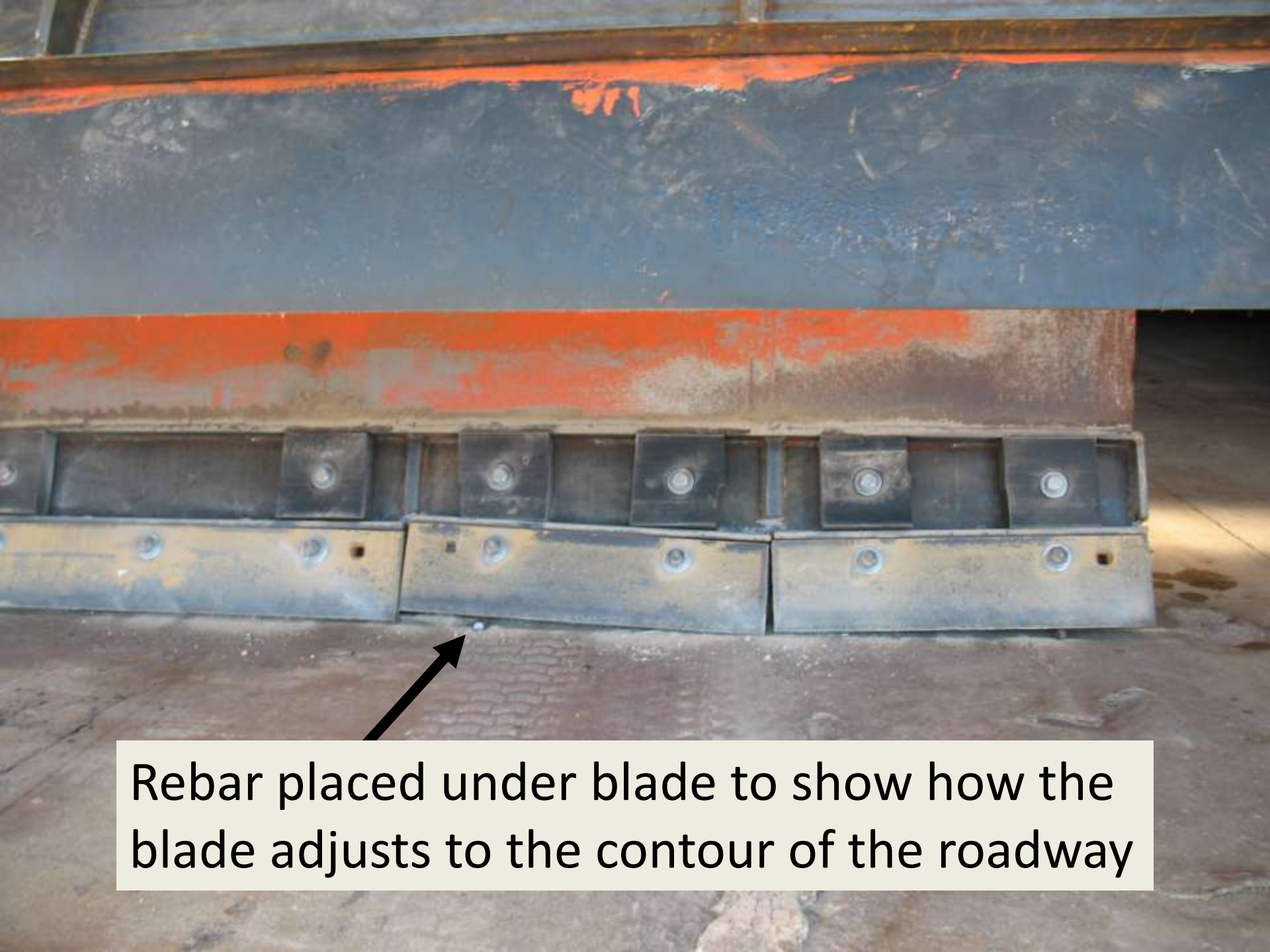
Flexible Edge blade


Rebar placed under blade to show how the blade adjusts to the contour of the roadway

Iowa Flex Edge

Flexible-Edge Blade Testing

Noise Testing

Blade Type	Plow Down *(decibels)*
PolarFlex	79.37
Joma 6000	79.50
Milo FlexEdge	82.05
Std. Carbide	83.63

Wear Testing

Blade Type	Inches of Carbide in Blade	Miles per inch of Carbide	Cost of 11' Blade Set	Cost per inch of Carbide	Cost per Mile
Joma 6000	1.00	4161.70	$1,226.89	$1,226.89	$0.35
PolarFlex	3/4	5911.90	$2,785.20	$3,713.60	$0.69
Std. Carbide	5/8	1295.95	$417.77	$668.43	$0.71
Milo FlexEdge (Iowa DOT Design)	5/8	*Not tested for wear*			

Note: Some flexible-edge blades were not worn out at the end of the test this season, hence the reason for comparing "Miles per inch of Carbide" to cost.

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New Moldboard Designs

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Expressway Plow

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Alaska Plow

Illinois Department of Transportation

Alaska Plow

Illinois Department of Transportation

Razor Blade Setup

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Razor Blade Setup

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KT Adaptor System

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Blade Saver Systems

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Blade Saver Systems

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New Western Star 6x6

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Western Star 6x6

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Western Star 6x6

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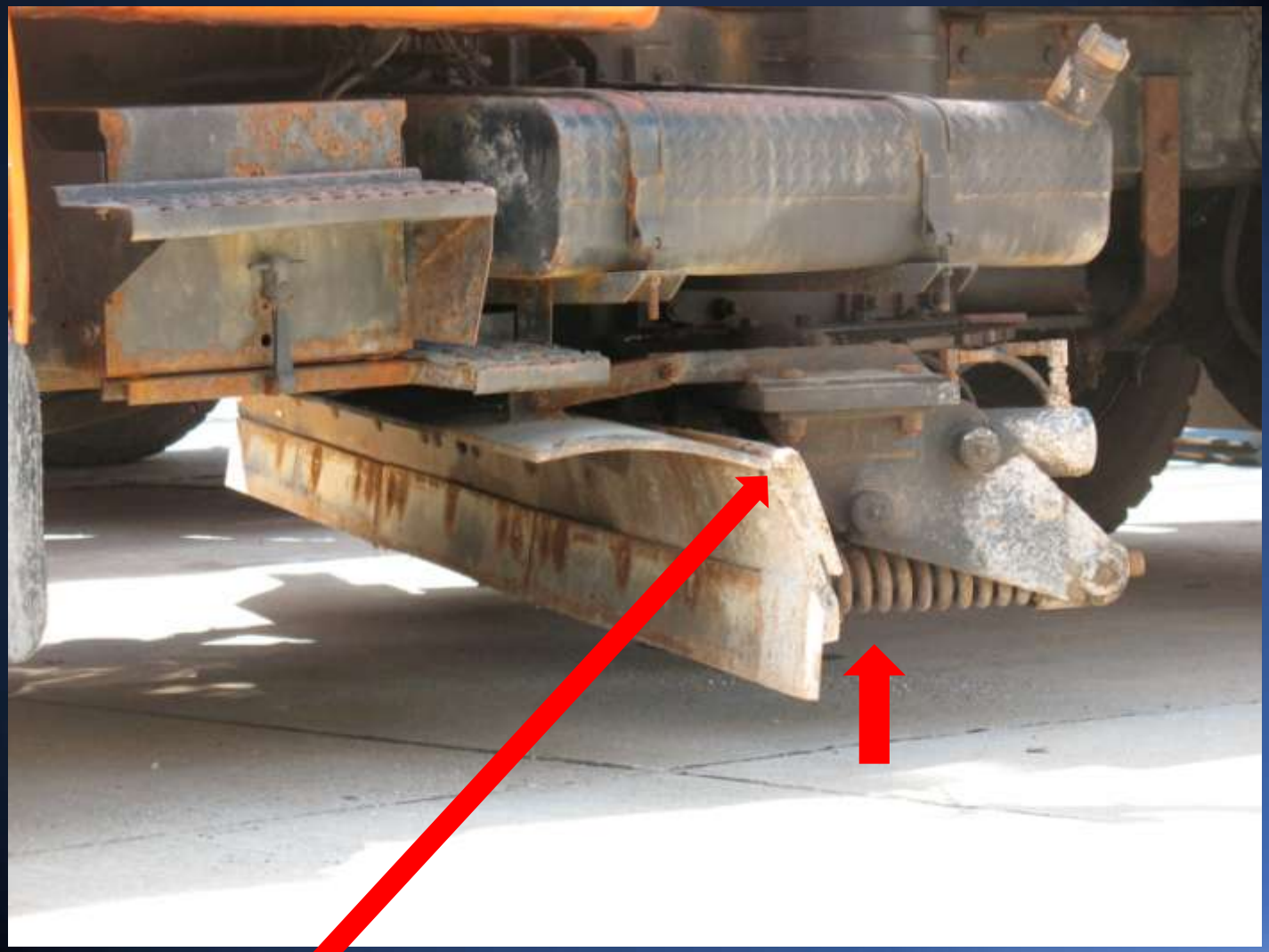
High-Speed Underbody Plow



Hinge - Moldboard hinges up for transport

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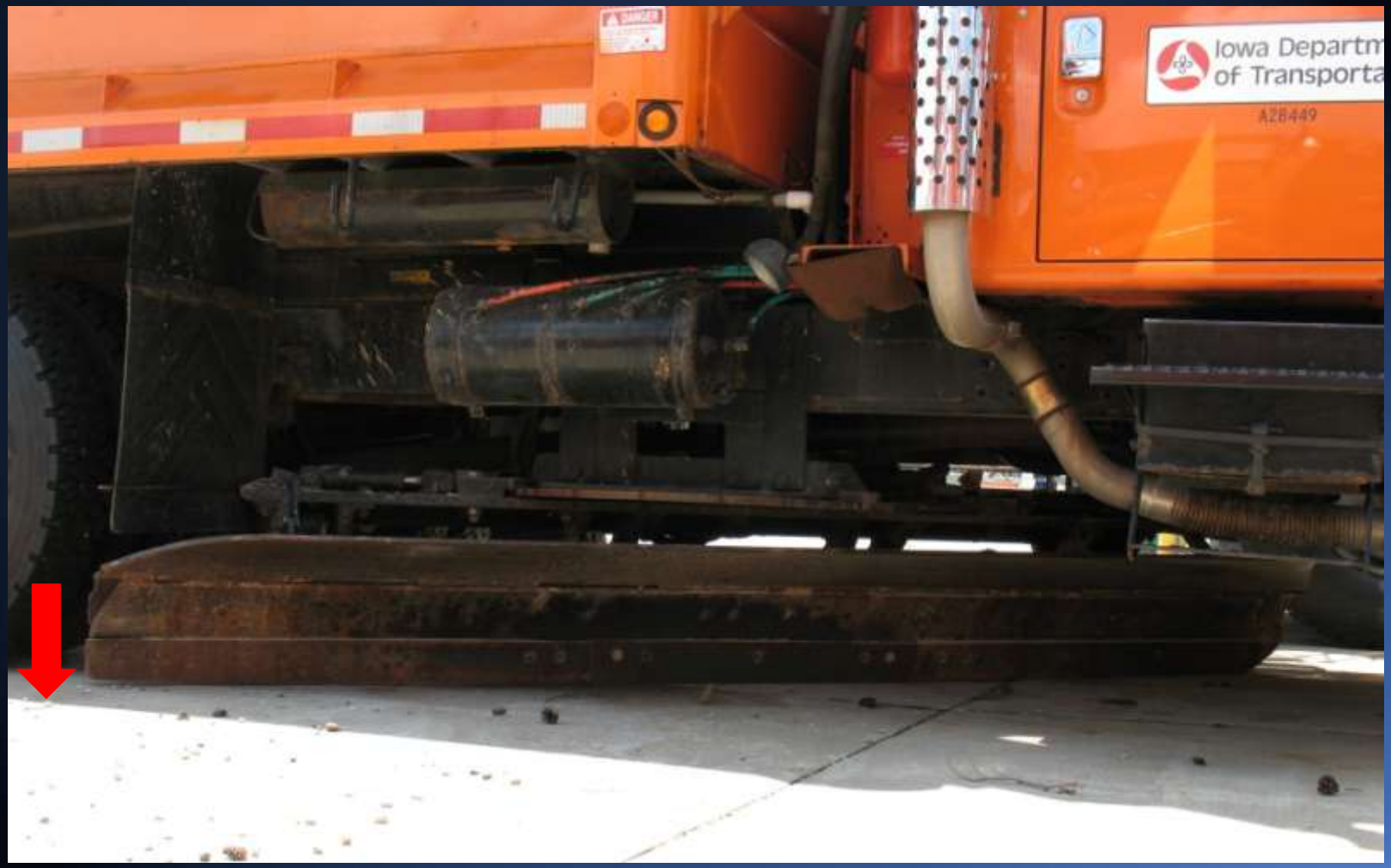
High-Speed Underbody Plow



Down Position – lift cylinders only exert enough down-pressure to keep blade in contact with the surface (500 PSI).

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Underbody Plow & Mid-Mount Wing

Single-Axle

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Underbody Plow & Mid-Mount Wing

Tandem-Axle

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Underbody Plow & Mid-Mount Wing

Tandem-Axle

16 Foot clearing path when in plowing position

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Underbody Plow & Mid-Mount Wing

Tandem-Axle

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Dual Mid-Mount wings

Single Axle

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Let’s go see the equipment!

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